

ITD Facility Risk Assessment, FRA-AO 02 (ITD Facilities with Computer Centers)

Name(s) of Risk Team Members: M.Heinrich, M.Stangel, J.Lemmon, J.Donnellan, J.Federmann, G.Gottschalk; and D.Gates, Joe DePace, S.Efstathiadis, E.Blum, E.Brosnan	Point Value → Parameter ↓	1	2	3	4	5
Area/Facility Description Title: ITD Facilities with Computer Centers-515 and 459, B.129 Deskside Technician Area, B.515 Modular Networking Area	Occupancy or Use	≤once/year	≤once/month	≤once/week	≤once/shift	>once/shift
Area/Facility # (if applicable): FRA-AO-02						
Area/Facility Description: In 515-the BCF and its basement, In 459-the Data Center (no basement) in 129- with only the Deskside repair area with work benches.	Severity	First Aid Only	Medical Treatment	Lost Time	Partial Disability	Death or Permanent Disability
Approved by: Susan McKeon Date: 9/15/2006 Revision 9/24/2007	Likelihood	Very Unlikely	Unlikely	Possible	Probable	Multiple
Revision Team Members: J.Reddy, D.Orsatti, D.Stampf, R.Hogue, G.Jorgensen, M.Stangel, G.Gottschalk, E.Blum, M.Heinrich		Comments: A BCF Safety Manual Is required to be read and signed and given to BCF Manager at the time of cardreader access.				

			Risk with Controls in Place					Risk with Additional Controls in Place				
Physical Item or Activity	Hazard(s)	Control(s)	Use A	Severity B	Likelihood C	Risk* AxBxC	Control(s) Added to Reduce Risk	Use A	Severity B	Likelihood C	Risk* AxBxC	
1-Working with powered equipment, computers/servers.	Shock,electrocution, arc flash injuries, burn, reflex injuries	Work planning,hire BNL Electrician to perform the work or to identify the rating before ITD technician/contractor touches the job. Use only appropriate components. Proper use of 1 power strip to wall outlet. Covered outputs, proper electric outlets above floor, below raised floor affixed. Strain relief to the wire. Soldering is never performed in a Computer Center. May need IH evaluation of some tasks and PPE required.	5	1	3	15	Perform GFCI testing compliance where appropriate.	5	1	3	15	

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2-Repairing equipment/machines at work benches (ITD and subcontractors).	Electrocution, cut by sharp edges, tripping risks	Housekeeping, Tier1, awareness of BNL electric power safety processes, training-new employee, web training requirements increased, safety topic at section meetings and dept.meetings – all to emphasize unplugging even under 50v	5	2	1	10	The work benches have flexible electric cords as part of the design of the bench. There exists a BNL/DOE evaluation of the feature’s safety risk.	5	1	1	5
3-Working on and under raised floor tiles. (with pulling cable out being the greater risk).. Underfloor has wires for alarms, electrical, plumbing for chilled water	Cuts from sharp edges on floortiles for cables to come up to equipment. Hurt foot or knee from weight of tile falling off puller. Trips, electrocution, possible water leaks, contact with legacy refrigeration from legacy A/C. What is calculation for # of tiles that can be opened with weight of nearby equipment? Hit shins, skin knuckles, chop finger, hurt toe	Floor tile pullers should be used to properly pull up tiles. Tiles should be put back in properly – not forced and kicked in breaking tiles and causing sharp edges. There should be BCF training document for all Users of equipment in BCF. Signage to warn of open floor. PPE-steel toed shoes when opening floor tiles. Under-floor control is the floor plan for knowledge. Inform BCF staff to shut off alarm when working underfloor. For cable installed-use twist locks not straight blade for power cable to avoid getting pulled out accidentally. Straight blade can be used inside a cabinet and then tied down, but not underfloor. See ITD JRA for Technical Telecommunication Activities (ie.cable pulling). Present rule – no more than 3 adjacent tiles to be opened.	5	3	2	30	Observations by managers from ITD and from other departments who have staff who work in the computer facilities. Facility policy to limit underfloor work.(459) No work to be performed without BCF management planning which pulls in BNL Electricians and Alarms Electricians. Increased use of Work Permits. Increase signage to find location of emergency floor pullers. Include Safety Engineering input to plan weight of equipment on floor tiles (is bracing needed to hold heavy equipment)-prejob planning.	5	2	2	20

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4-Moving and Lifting equipment	Back injury, hurt foot. Could lose control of load if it is heavy/high and needs to be tipped to get through a doorway.	Equipment is on casters. See ITD Lifting Manually JRA that includes online web classes. Use ladders, use 2 person rule according to weight, wide, solid steps, back training, ladder training. Use of ITD's various equipment/man lifts, dollies, carts. Is there a weight after which steel-toe shoes are required? Hire Plant Engineering Riggers as appropriate. Equipment not rated for floor never gets moved; ie.PDUs/QCDOC, to avoid floor collapse hazard	4	3	2	24	1-Onsite, hydraulic lifts have yearly Preventive Manitenance by Plant Engineering. 2-Inform all Users and their Supervisors of online web courses and of the JRAs and FRAs to provide all controls possible to the task. Back Safety, Portable Ladder Safety, Ergonomics in Mechanical and Industrial Work, Reducing Injuries and Accidents in the Workplace.	4	3	1	12
5-Wall switch power off for Category 0+ (circuits off at the panel box) to standalone mainframes for planned shutdowns of BNL grid. This is B.459	Shock,electrocution, arc flash injuries, burn, reflex injuries	Planned work with work permit. PPE to include goggles w/sides, shirt/pants, gloves, arc flash calculation process. Tier1 Inspections. Qualified BNL Electricians called in. Facility specific training for new employees – BNL and subcontractors – to underline proper safety processes	3	2	3	18	Purchased new PPE glasses w/sides, cotton shirt, gloves. This is B.459 specific.	3	2	2	12

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6-Close proximity in facility to electric panels, PDUs, cables, wiring, cable trays, bus work, wall sockets. And working with above.	Shock,electrocution, arc flash injuries, burn.	Covers securely in place, housekeeping, labels, signs, proper grounding, job planning, training, guarding, emergency procedures, locked or separated areas. There should be a BCF training document for all Users of equipment in BCF. Major installs should require input of BNL Electrical Engineer to work planning process before job begins.	5	3	2	30	Include Users on all Tier1 Safety Inspections. Signage on floor to require 36” open space on all sides of electric panels. Through all channels, advise of web training to Users and their Supervisors- Basic Electrical Safety, Electrical Safety 1, Electrical Circuit Breaker and Switch Operation Safety Creation of a new webcourse about electric safety for electronic technicians.	5	2	2	20
7-Close proximity in facility to lead acid batteries-in equipment.	Many users from many departments & sections-unknown safety values could increase risk of shock, burn.	Move to purchase gel cells, sealed lead acid. Program for replacement in all buildings onsite to maintain new battery installation. Safety features to process for cardreader access. Evaluation of flywheel UPS for large systems.	5	1	3	15					
8-Basement 515- Close proximity to lead acid batteries in enclosed room	Near hydrogen gas – a spark could cause an explosion with injuries. (Fan is not under EP PM and has been running for 20 years)	Storage controls-separate room, ventilation, labelling, sealed batteries, signage. Evaluation by Plant Engineering of room, power, fan for improvements including installation of monitor sensor for gas alarming as fan sucks hydrogen out; rather than blow air in. The switch and motor of the fan are a spark that could cause explosion.	3	4	4	48	Unique Work Permit (never a standing permit) written up each time and reviewed with actual workers that day. Door left open at all times and written as such. Either all contractors have CVO training or an ITD tech remains with them at all times. Keep door open during maintenance for proper access to emergency eyewash station.	3	5	1	15

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9-Basement-Maintenance of lead acid battery banks by vendor	Acid spills-burn skin, electric shock from series of batteries	Proper PPE include gloves, goggles, apron/coveralls. Work Permit process. Contractor Training taken by vendor and Purchase Order having safety language.	3	4	3	36	Involve actual contractors when they arrive with the Work Permit. At Purchase Order time, make sure webreq has the BNL Safety Language. CVO and Escort	3	4	2	24	
10-Basement-low piping and conduits	Hit on head, trips	Postings, signs, caution tape. Crawl space is signed as a hard hat area, hats located adjacent.	4	1	2	8						
11-Basement-tanks of inergen and halon	Explosion injuries from high pressure gas.	Alarms Electricians PM, Tier1 Inspection, Vendor maintenance. Made of code approved material	4	3	2	24	Entry into BNL Chemical Management System of the basement cylinders in the name of Emergency Services' Deputy Fire Chief for ownership	4	3	2	24	
12-Inergen/halon discharge in computer center	Emergency panic injuries, injured from hitting their sensors located underfloor or in some equipment racks	Local Emergency planning –review of affects of gas to staff, signage. There should be BCF training document for all Users of equipment in BCF. Staff review that sensors would have to be shorted not just break wire and there is time to push a stop button-training should be required.	5	2	2	20						

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13-Indoor air quality - in an office over Computer Center raised floor – B.459 specific	Uncomfortable (not hazardous as within standard) temperature for persons vs.comfortable temp for machines. Allergies, asthma, headaches, pulmonary exposure.	EP PM, involvement of ESH Coordinator and IH as needed. Building maintenance, changing air filters from A/C's and heaters as needed, recirculation quality (air exchange rate). Evaluate if air is in ducts or directly underfloor and if underfloor in 459 has ever been vacuumed. Air conditioning units have filters and regular PM replacement and positive ventilation (no dust is pulled into building). An evaluation has been performed by SHSD Industrial Hygienist and also by A/C Supervisor of actual temperatures with commercial testing equipment.	4	2	3	24	Individual A/C units were installed. When old areas are to be used in a new way, call in SHSD, A/C Shop Supervisor, and put in a Plant Engineering Work Order so an estimate can be obtained that looks at all facets including air quality.	4	2	2	16
14-Noise of machines issue	Temporary or long term hearing loss, headaches	Testing of areas and staff, posting, training, PPE if required or if desired. Tier1 Inspections	5	2	1	10	BCF has strobes as well as auditory alarms. Perform further noise level testing for staff and for facility. Provided earplugs in dispenser on wall by entrance. Signage. The web course, Noise and Hearing Conservation would benefit staff and their Supervisors.	5	2	1	10

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15-Electrical fire in facility	Burns from fire, smoke inhalation, inergen/halon inhalation	Tier 1 Safety Inspections, Plant Engineering Preventive Maintenance Programs, Fire detection and suppression systems, equipment protective systems. Maintenance, electrical & life safety code compliance, emergency procedures, BNL Emergency Services, signs/postings, marked exits, housekeeping, custodial services. Qualified Alarms Electricians called in.	5	2	1	10	Evaluation by Electrician member of BNL Electrical Safety Committee which confirmed that the underfloor electrical wiring meets OSHA requirements	5	2	1	10	

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16-Use of facility by Users from various departments	Trips, back/foot injury, electrocution – all due to unknown training of Users	An ITD process for new request for access: Supervisor requests original cardreader access for new employee for Computer Center. Approval must come from the Computer Center Manager for access. ITD has this point to place Controls. An email is used and now includes 4 Safety Items. The email goes to the new employee and to the Supervisor. There should be BCF training for all Users of equipment in BCF that covers the same topics. Present system relies on various departments various supervisors meeting the required employee responsibilities and is an unknown quantity. -----, Review of Local Emergency Plan details.	5	4	2	40	1-Confirmation that users from Physics receive regular Section Meetings that includes a Safety Topic that often relates to the BCF. 2-Confirmation that other departments require CVO when they have contractors onsite to work on their equipment in the BCF per BNL Policy. New BNL automated notification of Vendor Technician to perform work onsite. New ITD email to that BNL Escort of their responsibilities. 3- Identify key points related to use of the facility where safety information can be imparted to Users and their Supervisors – ie. at point ITD provides cardreader access, email can highlight risks and their controls. ie-BCF Manager contact with Users' Supervisors and Managers can be point of discussion for particular concerns. Use of "Stop Work" right by workers in BCF. ie-email response to the automatic message of visitor pass for onsite work to be performed which states staff responsibility to work planning & control. 4-Complete, circulate, communicate BCF Safety Manual to Users and Supervisors. Inform Users and Supervisors of Users thru several channels as identified.				

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17-All tasks that are maintaining BNL mission critical equipment-troubleshoot, diagnose, repair	Hurrying causes accidents, numerous trades responding to crisis increases complexity risks.	Property Protection Area status with cardreader. Alarm sensors monitor heat/cold, water/humidity to Staff with time for repair. Concrete block wall divide between main 515 and BCF is 2 hour fire barrier. Sources of evaluation of facility and equipment and utilitlies, such as, 2006 Electrical Safety Assessment-Lines of Inquiry (LOI), Tier1 Safety Inspections, others.	5	2	2	20									
18-All the tasks that are for overall facility security	Physical destruction with physical harm	PPA secure aspects, cardreader badge access only, cameras. Review of Local Emergency Plan, practice evacuation drills, lights are always on, laptop monitoring from home rather than driving in a storm or an emergency situation.	5	2	1	10									
*Risk:	0 to 20	21 to 40	41-60				61 to 80				81 or greater				
	Negligible	Acceptable	Moderate				Substantial				Intolerable				

Further Description of Controls added to Reduce Risk:

Lessons Learned from this Risk Assessment, Improvements, Positive Feedback:

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